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CLAIMS: J. T. Lin

I claim:

1. A surgical method for treating eye disorder of presbyopia and glaucoma by removing a portion of the sclera tissue of an eye comprising the steps of:
selecting a laser beam having a predetermined wavelength in the ultraviolet;
selecting a beam spot controller mechanism focus said laser beam to an articulated arm;
controlling said articulated arm to deliver said laser beam in a predetermined pattern onto a plurality of positions on the eye to remove a portion of the sclera tissue outside the limbus area;
whereby the treated eye will have increased vision accommodation and decreased intra ocular pressure.
2. A surgical method as claimed in claim 1, wherein said laser beam is an ultraviolet laser having a wavelength range of about (0.19 - 0.36) microns and a pulse energy of about (0.5-10) mJ on the sclera surface.
3. A surgical method as claimed in claim 1, wherein said laser beam is an excimer laser having a wavelength of 193 nm or 308 nm.
4. A surgical method as claimed in claim 1, in which said beam spot controller consists of at least one spherical focusing lens to couple said laser beam to said articulated arm.
5. A surgical method as claimed in claim 1, wherein said articulated arm having a length of (0.5-1.2) meter consists of at least 2 joints mounted with 45 degree highly ultraviolet reflecting mirrors.
6. The surgical method as claimed in claim 5, wherein said articulated arm is able to coupled at least 70% of the input said laser beam energy to the sclera surface with a spot size of (0.1-1.0) mm and centration accuracy better than 0.2 mm.

- 1 7. The surgical method as claimed in claim 5, wherein said articulated arm is
2 further connected to an end piece which can be detached for sterilization and
3 reuse.
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- 5 8. The surgical method as claimed in claim 7, wherein said end piece is
6 operated in a contact-mode to ablate the sclera tissue to a depth of about (300 -
7 800) microns.
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- 9 9. A surgical method as claimed in claim 1, wherein said articulated arm is
10 controlled by the surgeon to perform predetermined patterns outside the limbus
11 of the cornea.
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- 13 10. A surgical method as claimed in claim 1, wherein said predetermined
14 patterns are outside the limbus of the cornea and defined by the area between
15 two circles having radius of about 5.0 mm and 9.0 mm, respectively.
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- 17 11. A surgical method as claimed in claim 1, wherein said predetermined
18 pattern includes radial lines, curved lines, ring-dot or non-specific patterns
19 around the area outside the limbus.
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- 21 12. A surgical method as claimed in claim 1, wherein said accommodation is
22 caused by lens relaxation. and lens anterior shift.
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- 24 13. A surgical method as claimed in claim 1, wherein said accommodation is
25 caused by lens anterior shift.
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- 27 14. A surgical method as claimed in claim 1, wherein said laser beam is used
28 to ablate both the conjunctiva layer and said sclera tissue.
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